

CURVED GRATING SPECTROMETER WITH VERY HIGH WAVELENGTH RESOLUTION

Abstract

The present invention discloses a system comprising a compact curved grating (CCG) and its associated compact curved grating spectrometer (CCGS) module and a method for making the same. The system is capable of achieving very small (resolution vs. size) RS factor. In the invention, the location of entrance slit and detector can be adjusted in order to have the best performance for a particular design goal. The initial groove spacing is calculated using a prescribed formula dependent on operation wavelength. The location of the grooves is calculated based on two conditions. The first one being that the path-difference between adjacent grooves should be an integral multiple of the wavelength in the medium. The second one being specific for a particular design goal of a curved-grating spectrometer. In an embodiment, elliptical mirrors each with focal points at the slit and detector are used for each groove to obtain aberration-free curved mirrors.